

AMENDMENTS TO THE CLAIMS

Please replace all previously filed versions of the claims with the following listing of claims:

1. (Original) A re-configurable channel dropping de-multiplexer, comprising:
an input;
a first polarizing port optically coupled to the input;
a first polarization modulator optically coupled to the first polarizing port;
a polarization beam splitter (PBS) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;
a second polarization modulator optically coupled to the PBS at a second side of the PBS that is opposite to the first side;
a second polarizing port optically coupled to the second polarization modulator at a side opposite to the PBS; and
a multiple-channel output optically coupled to the second polarizing port.
2. (Original) The de-multiplexer of Claim 1, further comprising a first quarter-wave ($\lambda/4$) plate optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides.
3. (Original) The de-multiplexer of Claim 2, further comprising a second $\lambda/4$ plate optically coupled to the PBS at a fourth side of the PBS that is opposite to the third side and a mirror optically coupled to the second $\lambda/4$ plate at a side opposite to the PBS.
4. (Original) The de-multiplexer of Claim 3, further comprising an optical channel band pass filter optically coupled to the first $\lambda/4$ plate at a side opposite to the PBS.
5. (Original) The de-multiplexer of Claim 4, further comprising a third $\lambda/4$ plate optically coupled to the optical channel band pass filter at a side opposite to the first $\lambda/4$ plate.
6. (Original) The de-multiplexer of Claim 5, further comprising:

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a third polarizing port optically coupled to the third $\lambda/4$ plate at a side opposite to the optical channel band pass filter; and
a single-channel output optically coupled to the third polarizing port.

7. (Currently Amended) The de-multiplexer of Claim 6 functioning in a first operational state, wherein the first and the second polarization modulators are configured so as to rotate the orientation of plane polarized light by 90 degrees; and wherein the input receives and directs a plurality of optical channels to both the second polarizing port and the third polarizing port such that a single dropped channel is routed to the third polarizing port and such that the one or more remaining express channels are routed to the second polarizing port.

8. (Original) The de-multiplexer of Claim 6 functioning in a second operational state, wherein the first and the second polarization modulators are configured so as to not change the polarization plane orientation of plane polarized light; and wherein the input receives and directs a plurality of optical channels to the second polarizing port and no optical channels are directed to the third polarizing port.

9. (Original) The de-multiplexer of Claim 1, further comprising an isolator core optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides.

10. (Original) The de-multiplexer of Claim 4, wherein the optical channel band pass filter comprises a thin film band pass filter.

11. (Original) The de-multiplexer of Claim 5, operating as a channel adding multiplexer, wherein the multiple-channel output serves as a multiple-channel input for receiving a plurality of express channels, the single-channel output serves as a single-channel input, the input serves as an output, and the multiple-channel input is combined with the single-channel input to the output.

12. (Original) A re-configurable channel dropping de-multiplexer, comprising:
an input;

a first polarizing port optically coupled to the input;
a first polarization modulator optically coupled to the first polarizing port;
a polarization beam splitter having a first side s1 that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;
a second polarization modulator optically coupled to the PBS at a side s3 of the PBS that is not parallel to the first side s1;
a second polarizing port optically coupled to the second polarization modulator at a side opposite to the PBS 102; and
a multiple-channel output optically coupled to the second polarizing port.

13. (Original) The de-multiplexer of Claim 12, further comprising a first quarter-wave ($\lambda/4$) plate optically coupled to the PBS at a side s2 of the PBS that is opposite to the first side s1.
14. (Original) The de-multiplexer of Claim 13, further comprising:
a second $\lambda/4$ plate optically coupled to the PBS at a side s4 of the PBS opposite to the side s3; and
a mirror optically coupled to the second $\lambda/4$ plate at a side opposite to the PBS.
15. (Original) The de-multiplexer of Claim 14, further comprising:
an optical channel band pass filter optically coupled to the first $\lambda/4$ plate at a side opposite to the PBS;
a third $\lambda/4$ plate optically coupled to the optical channel band pass filter at a side opposite to the first $\lambda/4$ plate;
a third polarizing port optically coupled to the third $\lambda/4$ plate at a side opposite to the optical channel band pass filter; and
a single-channel output optically coupled to the third polarizing port.
16. (Currently Amended) The de-multiplexer of Claim 15 operating in a first state, further comprising a plurality of optical channels λ_1 - λ_n passing through the re-configurable channel dropping de-multiplexer from the first polarizing port to both the second polarizing port and the

third polarizing port such that a single dropped channel λ_d is routed to the third polarizing port and the one or more remaining express channels are routed to the second polarizing port.

17. (Original) The de-multiplexer of Claim 15 operating in a second state, further comprising a plurality of optical channels λ_1 - λ_n passing through the re-configurable channel dropping de-multiplexer wherein all the channels are routed to the second polarizing port.

18. (Original) A re-configurable channel dropping de-multiplexer, comprising: an input;
a first polarizing port optically coupled to the input;
a first polarization modulator optically coupled to the first polarizing port;
a polarization beam splitter (PBS) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;
a second polarization modulator optically coupled to the PBS at a second side of the PBS that is opposite to the first side;
a second polarizing port optically coupled to the second polarization modulator at a side opposite to the PBS;
a multiple-channel output optically coupled to the second polarizing port; and
an isolator core optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides.

19. (Original) A cascaded re-configurable system having two or more re-configurable channel dropping de-multiplexers, comprising:

a first re-configurable channel dropping de-multiplexer, comprising:
an input for receiving a plurality of channels;
a first polarizing port optically coupled to the input;
a first polarization modulator optically coupled to the first polarizing port;
a polarization beam splitter (PBS) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;
a second polarization modulator optically coupled to the PBS at a second side of the PBS that is opposite to the first side;

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a second polarizing port optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output optically coupled to the second polarizing port; and

a second re-configurable channel dropping de-multiplexer, optically coupled to the first re-configurable channel dropping de-multiplexer, comprising:

an input, coupled to the multiple-channel output of the first re-configurable channel dropping de-multiplexer;

a first polarizing port optically coupled to the input;

a first polarization modulator optically coupled to the first polarizing port;

a polarization beam splitter (PBS) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;

a second polarization modulator optically coupled to the PBS at a second side of the PBS that is opposite to the first side;

a second polarizing port optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output optically coupled to the second polarizing port.